

ABOUT LOUGHBOROUGH UNIVERSITY

CHEMICAL ENGINEERING

RESEARCH ASSOCIATE	
CONTINUOUS CRYSTALLISATION AND MANUFACTURING	
FIXED TERM UNTIL 30 SEPTEMBER 2016	
REQ15805	February 2015

As part of the University's ongoing commitment to redeployment, please note that this vacancy may be withdrawn at any stage of the recruitment process if a suitable redeployee is identified.

Project Information:

This research post is for the second phase of a five year multi-university research project which forms one of the activities in the EPSRC Centre for Innovative Manufacturing in Continuous Manufacturing and Crystallisation.

Pharmaceutical manufacturers operate in a fast changing market and are under constant pressure to reduce production costs, whilst complying with stringent product specifications. The vast majority of solid-form drugs require a crystallisation stage and up until now have been manufactured using traditional batch processes. New research will look at the development of continuous crystallisations, which promise to be more flexible, easier to scale-up and energy and cost efficient.

The EPSRC multidisciplinary centre will confront the broader challenges of developing new continuous manufacturing approaches for products such as medicines, foodstuffs, dyes, pigments and nano-materials, leading to more consistent levels of quality, lower costs, reduced energy requirements and more sustainable production.

The researcher will be based at Loughborough University but will have the opportunity to cooperate with the partner universities and companies in the UK. The aim of the research at Loughborough is to develop a crystallisation monitoring and control framework for continuous crystallisation processes, using a combination of mathematical modelling approaches and experimental investigations applying a series of process analytical technologies. The approaches will be evaluated for the crystallisation of products relevant to pharmaceutical, food, agrochemical, fine and bulk chemical industries. A further aim is to provide engineering designs that are amenable to adoption in commercial plants and robust on scale-up to industrial production capacities.

JOB DESCRIPTION

Job Grade: Research Grade 6

Job Purpose:

To develop crystallisation monitoring and control approaches for continuous crystallisation processes.

Duties and Responsibilities:

Research:

The post holder will be based in the Chemical Engineering Department at Loughborough University. The post holder will be responsive to specific project deliverables and developments, which include:

- Develop and evaluate experimentally a new crystallisation control approach based on the concepts of direct nucleation control or dynamic seeding to obtain desired crystal size distribution in different continuous crystallisations configurations.
- Develop continuous crystallisation control approaches for cooling and anti-solvent processes based on single and multiple stage mixed-suspension, mixed-product removal (MSMPR) type crystallisers
- Carry out experiments to evaluate the performance of the control approaches, using a series of process analytical technologies (such as focused beam reflectance measurement and ATR-UV/Vis spectroscopy) to monitor the experiments carried out in the course of the project.
- Analyse and interpret data obtained from the experiments and compare with the results of modelling studies.
- Cooperate with project partners enhanced through several research visits.
- Give presentations and make suggestions for further development of methodology.
- Disseminate research results in high quality publications in scientific journals and at high profile conferences.
- Engage in training programmes at the University (e.g. through Staff Development) that are consistent with their needs and aspirations and those of the School.
- To undertake such other duties as may be reasonably requested and that are commensurate with the nature and grade of the post.

Supervision:

The project will be supervised by Professor Chris D Rielly and Professor Zoltan K Nagy (Department of Chemical Engineering, Loughborough University).

Other:

All staff have a statutory responsibility to take reasonable care of themselves, others and the environment and to prevent harm by their acts or omissions. All staff are therefore required to adhere to the University's Health, Safety and Environmental Policy & Procedures.

All staff should hold a duty and commitment to observing the University's Equality & Diversity policy and procedures at all times. Duties must be carried out in accordance with relevant Equality & Diversity legislation and University policies/procedures.

The University is committed to enabling staff to maintain a health work-home balance and has a number of family-friendly policies which are available at: <http://www.lboro.ac.uk/services/hr/a-z/family-leave-policy-and-procedure---page.html>
We also offer an on-campus nursery with subsidised places, subsidised places at local holiday clubs and a childcare voucher scheme (further details are available at: <http://www.lboro.ac.uk/services/hr/a-z/>). In addition, the University is supportive, wherever possible, of flexible working arrangements.

We also strive to create a culture that supports equality and celebrates diversity throughout the campus. The University holds a Bronze Athena SWAN award which recognises the importance of support for women at all stages of their academic career. For further information on Athena SWAN see <http://www.lboro.ac.uk/services/hr/athena-swan/>.

CHEMICAL ENGINEERING

PERSON SPECIFICATION

Job Title: Research Associate

Job Grade: Research Grade 6

	Essential	Desirable
Education/Qualifications	A good honours degree in Science or Engineering (1)	A PhD or equivalent experience in Chemical Engineering, Computer Science, Control Engineering, Chemistry, Physics, or related discipline (1)
Experience	<p>Research experience of crystallisation processes (1,3)</p> <p>Knowledge and experience a number of Process Analytical Technologies (1,3)</p> <p>Recent research experience in an academic or industrial environment (1,3)</p> <p>A recent record of publications in high quality journals in the areas related to the project (1,3)</p>	<p>Experience using ATR spectroscopy, Raman spectroscopy for monitoring polymorphic transformations, FBRM and image analysis approaches (1,3)</p> <p>Good understanding of chemometrics techniques (1,3)</p> <p>Research experience in designing and performing crystallisation monitoring experiments (1,3)</p>
Skills and Abilities	<p>Ability to develop a research programme (1,3)</p> <p>Good interpersonal and organisational skills (3)</p> <p>Self motivated (1,3)</p> <p>Good verbal and written communication skills (3)</p> <p>Ability to write project reports and give oral</p>	<p>Good laboratory and analytical skills (1,3)</p> <p>Ability to formulate and analyse mathematical models and translate them into software (1,3)</p> <p>Ability to communicate and liaise with other project partners (1,3)</p>

	<p>presentations to large and small groups (1,3)</p> <p>Good IT skills and internet usage (1,3)</p> <p>Ability to integrate into a multidisciplinary team (3)</p>	<p>Skills to assist in supervising undergraduate and MSc projects (1,3)</p>
Training	<p>A willingness to undertake further training as appropriate and to adopt new procedures as and when required (3)</p>	
Other	<p>Commitment to observing the University's Equal Opportunity Policy at all times (3)</p>	

Stages in assessment (shown in brackets): **1**: application form at shortlisting, **2**: selection test, **3**: interview.

Conditions of Service

This is a full time, fixed-term appointment until 30/09/2016. The starting salary will be on Research Grade 6, £28,132 to £33,562 per annum at a starting salary commensurate with experience and qualifications.

The appointment will be subject to the University's normal Terms and Conditions of Employment for Academic and Related staff, details of which can be found at:

http://www.lboro.ac.uk/media/wwwlboroacuk/content/humanresources/downloads/acadrelatedcos_v1.pdf

Informal Enquiries

Informal enquiries are welcomed and should be directed to Professor Chris D Rielly by email C.D.Rielly@lboro.ac.uk or by telephone on +44(0)1509 222504.

Application

The closing date for applications is **27 March 2016**.